Containerized Kitchen Pre Planned Product Improvement (CK P³I)

Thermal Fluid/Cogeneration will provide improved heat and electric power capabilities to the Containerized Kitchen (CK). As an integral part of the Pre Planned Product Improvement for the CK, cogeneration will reduce operating and support costs by enhancing the heating system, the appliances, and the integration of the sanitation function.

Why is it Needed?

Current field kitchen technology is based on methods and equipment originally developed in the 1930s. Evolutionary improvements have put the 1930s equipment on different trailers and containers, converted burners from gasoline to JP8, and added generators. However, the appliances have low capacity requiring a series of batches that take excessive time and labor. The open-flame burners are inefficient, consume too much fuel, and overheat the kitchen. The sanitation center uses a three-sink immersion process that consumes a large amount of fresh water and produces gray water, which must be back-hauled and treated. Accordingly, the military needs modern technology to reduce the logistical footprint of field-feeding including labor, fuel, water, and transportation requirements.

Technology:

Cogeneration is a single process that provides two forms of energy. The small quiet cogenerator can replace the 9 Modern Burner Units (MBUs) and the 10kW generator used in the CK and Sanitation Center. The cogenerator will provide the heat and electric power for high capacity commercial appliances that have been modified by replacing the electric heating elements with finned tube heat exchangers. One solution will use an oil burner to heat water to high temperature and pressure that is circulated in a closed loop, first through the griddle and ovens, and then injected in a scroll expander that drives a generator to produce 2kW of electric power. After the high pressure hot water changes to steam in the expander, it is condensed to low pressure water in jacketed kettles, a water heater, sinks, and a gray water still.

Key Features / Benefits:

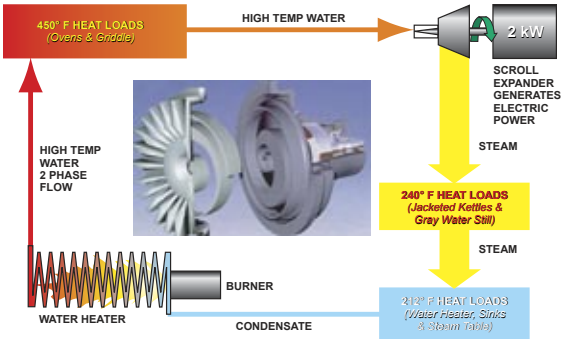
Reduced Labor…high capacity commercial appliances significantly increase the output of the kitchen and reduce the time and labor — from 20 Warfighters to 7 — required to prepare meals.

Less Fuel Consumption…by burning fuel in a closed combustion system and "cogenerating" heat and electric power, fuel consumption is reduced from 25 gallons/meal to 5.

Reduced Logistics Burden…backhauling and water consumption significantly reduced — with the integration of the sanitation function and gray water recycling — from 240 gallons/day to 40.

Improved Safety…elimination of the 10kW generator reduces noise and vibration.

Commercial and Military Applications…cogeneration technology has been transferred to residential applications and can provide continued product improvement and affordability for the military.



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